

REMARKS

Claims 1-39 are currently pending in this application. In the Final Office Action dated August 18, 2009, the Examiner maintained the rejection of claims 1-26, 35, and 39 under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent No. 5,556,708 to Hörl et al. ("Hörl") in view of U.S. Patent No. 5,037,656 to Pitt et al. ("Pitt"); the rejection of claims 27-30, 32, and 36 under 35 U.S.C. § 103(a) as allegedly being obvious over Hörl in view of Pitt and further in view of U.S. Patent No. 6,774,102 to Bell et al. ("Bell"); the rejection of claim 31 under 35 U.S.C. § 103(a) as allegedly being obvious over Hörl, in view of Pitt, in view of Bell, and further in view of U.S. Patent No. 4,668,399 to Duggins ("Duggins"); and the rejection of claims 33, 34, 37, and 38 under 35 U.S.C. § 103(a) as allegedly being obvious over Hörl, in view of Pitt, in view of Bell, and further in view of U.S. Patent No. 4,618,533 to Steuck ("Steuck").

By this Reply, Applicant has amended claims 1 and 14 to replace the term "amino functional groups" with the term "primary or secondary amines," and to recite the phrase "wherein the graft copolymerization does not require the use of an organic solvent." Support for those amendments can be found throughout the application, for example, in the original claims, and at lines 10-15 on page 3 and lines 14-16 on page 5 of the specification. Thus, no new matter has been added.

I. Withdrawn Objections and Rejections

Applicant notes that the Examiner has not maintained the objection to the specification for informalities, or the rejection of claims 3 and 15 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. Accordingly, Applicant considers these objections and rejections withdrawn.

III. Examiner's Interview Summary

Applicant thanks the Examiner for conducting a telephonic interview with his representative, Amanda Murphy, on December 8, 2009, to discuss the Office Action and the amendments to the claims presented herein. Applicant believes the claim amendments and remarks presented in this Reply accurately reflect the content of the interview.

II. Section 103 Rejections

The Examiner has maintained the following rejections under 35 U.S.C. § 103(a):

- Claims 1-26, 35, and 39 were rejected as allegedly obvious over *Hörl* in view of *Pitt*;
- Claims 27-30, 32, and 36 were rejected as allegedly obvious over *Hörl* in view of *Pitt* and further in view of *Bell*;
- Claim 31 was rejected as allegedly obvious over *Hörl* in view of *Pitt* and *Bell*, and further in view of *Duggins*; and
- Claims 33, 34, 37, and 38 were rejected as allegedly obvious over *Hörl* in view of *Pitt* and *Bell*, and further in view of *Steuck*.

See Office Action at pp. 3-13. Applicant respectfully traverses each of these rejections.

Several basic factual inquiries must be made to determine whether the claims of a patent application are obvious under 35 U.S.C. § 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or non-obviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18; *see also KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1734 (2007). "To reach a proper determination under 35 U.S.C. § 103, the Examiner must step backward in time and into the shoes worn by the hypothetical 'person of ordinary skill in the art' when the invention was unknown and just before it was made." M.P.E.P. § 2142, 8th Ed., July 2008 Rev. Once the findings of fact are articulated, the Examiner "must then make a determination whether the claimed invention 'as a whole' would have been obvious at the time to that person." *Id.*

Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness because the combinations of references cited in these rejections fail to teach or suggest the claimed invention as a whole. Specifically, Applicant submits that one skilled in the art at the relevant time would not have interpreted the combinations of references cited by the Examiner as teaching or suggesting graft copolymerization that (1) involves primary or secondary amines and (2) does not require the use of an organic solvent, as recited in the currently pending claims.

A. Section 103(a) Rejection of Claims 1-26, 35, and 39

In this rejection, the Examiner relies on *Hörl* for allegedly "[p]roviding a solid substrate ... wherein amino functional groups are coupled to the substrate surface ... [c]ovalently coupling the amino functional groups with a reducing agent ... [and] [c]ontacting the substrate surface with a solution of polymerizable monomers." (Office Action at p. 3.) The Examiner relies on *Pitt* for allegedly "[p]roviding a porous membrane ... [c]ovalently coupling a thermally labile radical initiator to the membrane ...

[and] [c]ontacting the substrate surface with a polymerizable monomer solution." *Id.* at p. 4. The Examiner contends that the invention of claims 1-26, 35, and 39 is allegedly obvious in view of the combined teachings of *Hörl* and *Pitt*. See *id.* at p. 4. Applicant respectfully disagrees.

The currently pending claims recite a method for producing a separating material by "coupling ... primary or secondary amines with a thermally labile radical initiator" (claim 14), and the separating materials produced by such a process (claim 1). In contrast, *Hörl* describes a method for grafting "a nitrogen-containing polymer with an ethlenically unsaturated monomer ... in the presence of ... carbon tetrachloride and a reducing agent" Specification at p. 1, ll. 29-31 (see also *Hörl* at col. 4, ll. 25-31). Although *Hörl* states that nitrogen-containing polymers containing primary or secondary amino groups are suitable for use in the method disclosed therein (see at column 5, lines 42-46), in fact, the chemical principles behind *Hörl*'s method cannot be used to couple primary or secondary amines, as recited in the currently pending claims.

For example, as discussed in the Declaration Under 37 C.F.R. § 1.132 ("Storr Declaration")¹ submitted herewith, *Hörl*'s method involves using a reducing agent to form free radicals on nitrogen-containing polymers in the presence of carbon tetrachloride, thereby "activating" the polymers so they can react with ethlenically unsaturated monomers. See Storr Declaration at ¶ 6. Dr. Storr explains that reducing agents act on organic molecules either by decreasing the molecule's oxygen content, or increasing its hydrogen content. See *id.* at ¶ 7. However, primary and secondary

¹ Dr. Storr is an employee of the assignee of this application, Gambro Dialysatoren GMBH.

amines have no oxygen molecules that can be removed by a reducing agent, and are incapable of receiving an additional hydrogen molecule from a reducing agent. *Id.* at ¶ 9. *Hörl* provides no evidence that reducing agents can be used to "activate" primary and secondary amino groups for graft polymerization, and only demonstrates the method disclosed therein for activating nitrogen-containing polymers having polyamide groups in the side chain. See, e.g., *Hörl* at Examples. Thus, Dr. Storr concludes that "one skilled in the art would not have expected success from using [*Hörl's*] method to 'activate' solid substrates containing primary or secondary amino groups" and, therefore, "would not have chosen the method disclosed in *Hörl* as a starting point for graft polymerizing a solid substrate having primary and secondary amines, as recited in the currently pending claims." *Id.* at ¶ 12.

Pitt fails to cure these deficiencies in *Hörl*, because *Pitt* provides no reason to expect that *Hörl's* method, which uses a reducing agent to activate nitrogen groups on solid substrates, can be used with primary or secondary amino groups. Indeed, *Pitt* does not discuss reducing agents or primary and secondary amino groups at all. For at least these reasons, the Examiner has failed to establish a *prima facie* case of obviousness because the cited combination of references fails to teach or suggest the claimed invention as a whole.

Even assuming, *arguendo*, that one skilled in the art would have chosen *Hörl's* method as a starting point for graft copolymerization of polymers containing primary or secondary amino groups, nothing in the combination of references cited by the Examiner teaches or suggests that *Hörl's* method can be modified so that it "does not require the use of an organic solvent," as recited in the currently pending claims. The

only solvents discussed in *Hörl* are organic solvents. See, e.g., *Hörl* at col. 4, ll. 25-31. Moreover, according to lines 40-52 in column 4 of *Hörl*, the authors cannot explain the mechanism on which the method is based. Thus, although *Pitt* mentions that "suitable solvent compositions include water" (see at column 5, line 11), one skilled in the art could not have predicted which steps of *Hörl*'s method may be modified and, therefore, would not be inclined to deviate from the teachings of *Hörl* based on the teachings of *Pitt*. Indeed, if negative results might occur from a particular combination of prior art elements, the invention is not obvious. See *Takeda Chem. Indus., Ltd. v. Alphapharm Pty., Ltd.*, 492 F.3d. 1350, 1359 (Fed. Cir. 2007). Thus, the combination of references cited by the Examiner fails to teach or suggest the claimed invention as a whole.

For at least the reasons discussed above, independent claims 1 and 14 are allowable over *Hörl* in view of *Pitt*. Accordingly, claims 2-13, 15-26, 35, and 39 are also allowable over *Hörl* in view of *Pitt*, due at least to their dependence from either allowable independent claim 1 or 14, and due to their additional recitations of novel subject matter. Accordingly, Applicant respectfully requests that the Examiner withdraw the obviousness rejections under 35 U.S.C. § 103(a) of these claims.

B. Section 103(a) Rejections of Claims 27-34 and 36-38

Applicant also traverses the rejection of claims 27-30, 32, and 36 based on *Hörl* in view of *Pitt*, and further in view of *Bell*; the rejection of claim 31 based on *Hörl* in view of *Pitt* and *Bell*, and further in view of *Duggins*; and the rejection of claims 33, 34, 37, and 38 based on *Hörl* in view of *Pitt* and *Bell*, and further in view of *Steuck*. None of the additional secondary references cited by the Examiner (*Bell*, *Duggins*, and *Steuck*) cures the deficiencies of the proposed combination of *Hörl* and *Pitt* discussed above,

since these references also fail to teach or suggest graft copolymerization that (1) involves primary or secondary amines and (2) does not require the use of an organic solvent, as recited in the currently pending claims.

For at least these reasons, Applicant submits that claims 27-34 and 36-38 are allowable over the cited references at least due to their dependence from either allowable independent claim 1 or 14, and due to their additional recitations of novel subject matter. Thus, Applicant respectfully requests that the Examiner withdraw the obviousness rejections under 35 U.S.C. § 103(a) of these claims.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

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